



White-Nose Syndrome



Little brown bats in New York with WNS. Photo by: Nancy Heaslip NYDEC

WHAT IS WHITE-NOSE SYNDROME?

White-nose syndrome (WNS) is a disease causing mass die-offs of bats at hibernation sites, with mortality rates of 90—100 % at some locations. Confirmed in the United States in 2006, the U.S. Fish and Wildlife Service estimates 5.6—6.7 million bats died from WNS in the first 7 years. Bats affected by WNS have been detected in 33 U.S. states and seven Canada provinces. The fungus is also present in Europe and China; however, population-level effects appear to be less severe in these locations.



DE tri-colored bat with WNS. Photo: DEFW

WNS is caused by a fungal pathogen called *Pseudogymnoascus destructans* (*Pd*), which grows in cold, dark, and damp places. *Pd* erodes the bat's skin tissue and causes more frequent arousal during hibernation; resulting in cellular disruptions, dehydration, starvation, and often death. Scientists have identified the agent that causes the condition, developed tools for diagnosing WNS, learned how the disease infects and kills bats, and began testing treatments in the field. Research is ongoing to better understand and prevent WNS.

SPECIES AFFECTED

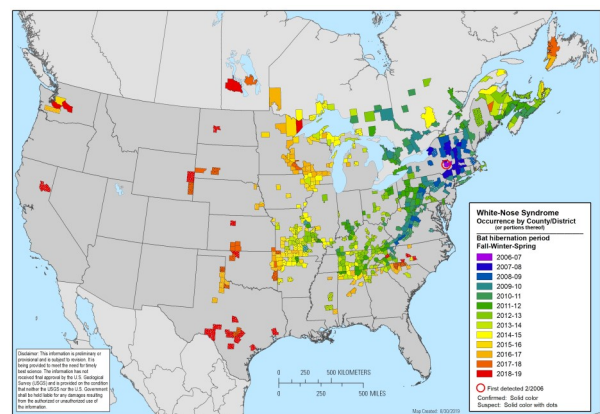
So far, only bats that hibernate communally are affected. In Delaware, that includes five species; little brown, big brown, tri-colored, northern long-eared, and eastern

small-footed bats. Of those affected, little brown and northern long-eared bats are listed as endangered species in Delaware.

Nationally, 12 species have been confirmed with WNS and another seven species have been exposed to the fungus with no diagnostic signs of WNS yet. No human, pet, or livestock illnesses have been linked to WNS and no wildlife other than bats have exhibited signs of WNS.

SIGNS OF WHITE-NOSE SYNDROME

- White fungus growing on exposed skin: muzzle, wings, ears, and/or tail.
- Not all bats with WNS have visible fungus, but it has still grown into their skin tissues and caused extensive damage.
- The fungus requires cold temperatures to grow and is not seen on bats during summer or fall.
- Low weights, emaciation, and wing scarring.
- Strange behaviors at hibernacula: bats flying outside during the day in winter, clustering near the entrance, or flying to their summer colony in winter.
- Dead bats on the landscape in winter.



Citation: White-nose syndrome occurrence map - by year (2018). Data Last Updated: 8/30/2018. Available at: <https://www.whitenosesyndrome.org/white-nose-syndrome-map>



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WHY BE CONCERNED?

- WNS could result in regional extinctions of some once-common bat species.
- WNS is spreading alarmingly fast (see map).
- WNS could reduce the reproductive rates of bats who survive lighter infections of the disease, further decreasing bat populations.
- Losing large numbers of bats may upset the food web, causing unknown ecological problems; including possible increases of mosquitos and the diseases they carry.
- Northeastern bats are insectivores and consume many nuisance insects, such as mosquitos and agricultural pests. One bat can eat 50—75% of its body weight in flying insects each summer night. That's nearly 600 insects per hour!



Healthy big brown bat pup in DE. Photo: DFW

HOW IS IT SPREAD?

- The fungus can spread directly from bat-to-bat, from substrate to bat, and people can spread it by accidentally carrying the fungus on shoes, clothing, or gear.
- Migrating bats carry spores hundreds of miles.



DE little brown bat with heavy wing scarring. Photo: DFW

- People (cavers, researchers, and casual visitors) could inadvertently spread it by visiting affected sites and then unaffected sites (caves, mines, or buildings where bats hibernate).

WHAT IS BEING DONE

Nationally:

- U.S. Fish and Wildlife Service developed a national White-Nose Syndrome Response Plan, and is conducting, funding, and coordinating research.
- Universities, government agencies, and NGO's are researching specific questions and solutions.
- Disease treatments being tested include applying bacteria or fungi to inhibit *Pd* growth in bats or caves, developing vaccines to fight *Pd*, using anti-fungal to treat bats or reduce cave contamination, modifying hibernation environments to inhibit *Pd* growth, and using UV light to kill *Pd*.
- Protocols are in place for systematic action to protect bats, document WNS events, and population changes. In some areas, voluntary or mandatory restrictions are placed on cave visitation to help protect surviving bats at their hibernacula.

Delaware:

- Part of national and multi-state agency teams working to track the disease, plan research, and find answers.
- Collecting information on location and size of summer colonies for population monitoring.
- Participating in the North American Bat Monitoring Program (NABat).
- Managing a volunteer project, *Bat Spotters*, to help study Delaware's bat populations.
- Providing information about bats to interested Delawareans in order to prevent the spread of WNS from Delaware to novel locations.